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ORANGE RUST OF BLACKBERRIES

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Orange rust is one of the most common diseases of blackberries and dewberries in Florida. The disease is widely distributed over the United States and, in fact, many other parts of the world. Both wild and cultivated plants are susceptible to its attacks. In addition to being an important disease, it is one of the most conspicuous on account of the bright orange-yellow spore masses from which the disease gets its common name.

SYMPTOMS

Orange rust is most commonly observed in the spring but occasional specimens may be found throughout the growing season. The first stage to attract attention is that in which the dusty orange-yellow powder covers the under side of the leaves, but by closer examination the disease may be detected long before that time. When infected shoots first appear, they are weaker and more spindling than healthy ones. The general color is paler with a distinct yellowish cast, so that the disease is often miscalled "yellows". The leaves on infected shoots stand upright and remain so instead of spreading out horizontally as do the leaves on normal shoots. If such diseased shoots are examined closely, especially with a hand lens, numerous tiny glistening yellow knobs are seen scattered over the affected leaves. These are the pycnia or the first spore stage produced by the fungus. This spore stage does not seem capable of infecting healthy plants.

A few weeks after this first stage has been observed, the second and conspicuous stage is developed. Many small cushion-shaped blisters may be found, principally between the veins on the underside of the leaves. These are covered with a thin membrane and are light yellowish orange in color. The membrane ruptures in a day or two and myriads of spores in the form of a bright orange-yellow dust are liberated. When these blisters or pustules rupture, their margins frequently become indistinct and the whole underside of the leaf appears to be producing a solid mass of the spores. Occasionally a few pustules are formed on the stem and burst in the same manner. So many spores are produced that the ground and neighboring plants may be colored by the heavy deposits of the yellow spore dust. Walking through an infected patch may leave the clothing tinted with the characteristic color and the shoes dusted with a layer of the spores. This is the most characteristic stage of the disease and the one in which it is most infectious.

Diseased canes never grow as tall as the healthy ones and they always have a weak, slender growth. Sometimes more shoots are produced than in the case of healthy plants. Heavily infected shoots do not always live until the second year and those that do live over are always diseased and produce a characteristic growth. On old canes several weak, spindling sprouts grow from each node and form a sort of witches'-broom, while the leaves on the sprouts bear more of the pustules full of orange-yellow spores.

Rusted canes never produce any flowers. Consequently, diseased canes are not only a menace to healthy plants, but contribute nothing to the fruit crop.

THE CAUSE

The cause of orange rust is a minute parasitic fungus belonging to the *UREDINALES* or true rusts. Moreover, it is an obligate parasite, that is, it cannot exist except on the host plant, such as a blackberry, dewberry, or raspberry. Although the disease is most conspicuous on the young, leafy shoots, the causal fungus invades other parts of the plant, especially the crown and roots where it can exist from one season until the next. Thus, a plant showing symptoms of orange rust this spring will have the disease again next spring, even though the disease is not apparent during late summer nor in the winter dormant season. When growth is resumed, the fungus grows up with the new shoots and produces the typical disease as they expand.

As stated above, the pycnial stage of the fungus does not infect healthy plants, but the millions of orange-yellow spores produced in the second stage are all capable of spreading the disease. Young shoots just appearing through the soil are susceptible to infection by these powdery spores. It is not necessary for the diseased plant to be very close to healthy ones for the disease to be transmitted, as the spores can be carried some distance by the wind; just how far is not definitely known.

HOST SUSCEPTIBILITY

So far as known, all varieties of blackberries, dewberries, and raspberries are subject to attacks of this disease, although some are more resistant than others. All cultivated varieties grown in Florida are susceptible to orange rust and all the wild species have been found infected. Some wild species are frequently and heavily infected with the disease. Spores from the wild plants are entirely capable of attacking the cultivated species.

CONTROL

Since orange rust of blackberries is a systemic disease, that is, lives in the roots, stems, and leaves of the host, sprays and other chemical treatments are entirely useless.

The first precaution to be observed is to plant only healthy stock. Be sure that the young plants and the nursery from which they come are free from this disease.

In an established planting, the next best thing to do is to remove all diseased plants just as soon as they can be recognized. They must be taken up root and all or shoots growing from these will later become sources of infection. Learn to detect the disease in its early stages before the spores are shed. If a plant is taken out while it has only the pycnial stage, it has not had a chance to infect any of the neighboring plants. The upright habit of growth, the yellowish color, together with the tiny glistening, yellowish dots are good characters by which to recognize diseased plants in the early stages. Plants showing these symptoms should be taken out before they have a chance to shed the orange yellow spores and spread the disease.

Another precaution that it is wise to follow consists in the removal of all wild plants from fence rows and adjacent fields, as it eliminates one very important source of future infections for your berry patch. This is especially essential if these have ever shown symptoms of the disease.

Finally, if you propagate plants either for new plantings or to replace those rogued out of your fields for any reason, be sure that the plants from which you get the cuttings or suckers are entirely free from the orange rust disease.